

Applicant: KADOYA, Minoru
Serial No.: 10/810,693
Filed: March 29, 2004
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AMENDMENTS TO THE SPECIFICATION

Please replace the Abstract with:

-- ABSTRACT

In an end pumped or axially pumped solid state laser using a laser diode as a pumping light source, the laser crystal comprises a plurality of individual laser crystals arranged along an axial direction that have progressive higher concentrations of rare earth ~~irons-ions~~ toward the output end. By thus arranging the individual laser crystals containing varying concentrations of rare earth ions, the absorption of laser for each length can be made uniform so that the tolerance for a high power pumping light is increased, and the laser output can be maximized without damaging the laser crystal. --

In the Specification:

Please replace the paragraph starting on page 5, line 31 and ending on page 6, line 4, with the following:

-- The first individual laser crystal is required to have a Nd³⁺ concentration which is low enough not to be ~~damage-damaged~~ by the pumping laser as the pumping laser first enters the laser crystal from here. When an output light from a 40 W laser diode is focused into a diameter of 600 μm to pump a laser crystal, the Nd³⁺ concentration should be in the range of 0.2 to 0.3 atomic % for the required pumping to be accomplished without damaging Nd:YVO₄. The required length of the laser crystal is 1.1 mm to 1.7 mm, and should be acceptable for most applications. If the concentration is reduced from this level, the length of the laser crystal required for the adequate absorption of the pumping laser becomes longer, and this causes the density per unit area to be reduced since the quality of the beam of a laser diode for pumping is not high. Therefore, the Nd³⁺ concentration should be preferably in the range of 0.2 to 0.3 atomic %. --

Please replace the paragraph on page 7, starting on line 14 and ending on line 23, with the following:

-- Based on such recognitions, the present invention improves a solid ~~date-state~~ laser by providing a solid state laser, comprising: a laser resonator including an output mirror, a laser crystal containing rare earth ions and at least one reflecting mirror, the output mirror, laser crystal and reflecting mirror being arranged along an optical axis, a laser diode for emitting pumping light; a pumping optical system for focusing pumping light emitted from

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the laser diode onto the laser resonator coaxially with the optical axis; wherein the laser crystal comprises a plurality of individual laser crystals arranged along the optical axis, the individual laser crystals being each made of a material having a composition expressed by a same chemical formula and having progressive higher concentrations of the rare earth ions toward the output mirror. --

Please replace the paragraph on page 8, starting on line 24 and ending on line 26, with the following:

-- FIG. 7a is a graph showing the relationship between the power absorption per unit length with the distance from the input end when the laser crystal consists of three individual laser crystals; --

Please replace the paragraph on page 8, starting on line 33 and ending on line 35, with the following:

-- FIG. 8a is a graph showing the relationship between the power absorption per unit length with the distance from the input end when the laser crystal consists of two individual laser crystals; and --